

REMARKS

Applicants respectfully request entry of the following amendment and remarks contained herein in response to the Office Action mailed August 18, 2006.

In response to the Office Action dated March 10, 2006, Applicants respectfully request reconsideration based on the above claim amendments and the following remarks. Applicants respectfully submit that the claims as presented are in condition for allowance.

Claims 1-6 are pending in the present application. Claims 1-6 have been rejected. Claims 1, 4 and 6 have been amended, leaving claims 1-6 for further consideration upon the entry of the amendment. No new matter has been added by the amendment.

Drawing Objections

The drawings stand objected to as failing to comply with 37 C.F.R. 1.84(p)(5) as including a reference character, namely V16 in FIG. 1, not mentioned in the specification. The specification has been amended to include a description of V16 as indicated above. Accordingly, it is respectfully submitted that Figure 1 is now fully supported by the specification in view of the added contents regarding "a first main purge valve V16."

Therefore, it is respectfully requested that the objection to the Drawings be withdrawn.

Specification Objections

The disclosure stands objected to for informalities. The Examiner states that the phrase "Figure 14" on page 8, line 16 should read "Figure 4". Additionally, the Examiner states that pages 6-8 should mention that the figure being described is FIG. 2. Correction as suggested by the Examiner is reflected in the amendments to the specification as outlined above.

Accordingly, it is respectfully requested that the objection to the specification be withdrawn.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-6 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Paranjpe et al. (U.S. Patent Publication No. 2003/0003635, hereinafter "Paranjpe"). The Examiner states that Paranjpe discloses all of the elements of the abovementioned claims except,

spraying an inert gas through showerhead zone 203A while the ozone is sprayed through 203B and spraying an inert gas through the showerhead zone 203B while TMA is sprayed through 203A, which the Examiner further states the importance of which for avoiding cross-contamination would have been realized by one of ordinary skill in the art. The Examiner further states it would have been obvious to one of ordinary skill in the art to modify Paranjpe to include flowing inert gas out of one showerhead zone while the other was being used to spray oxidant or reactant in order to prevent co-flow of oxidant and reactant into the delivery system and consequent formulation of alumina powder on the showerhead. Applicants respectfully traverse for at least the reasons presented hereinbelow.

Claim 1 has been amended to include a purging step (S2-2, S2-4), which includes spraying an inert gas into the reaction chamber for purging the remaining gas, and a vacuum purging step, which prevents all the gases from inflowing into the reaction chamber and vacuumizes the inside of the reaction chamber for purging the remaining gas. It is also featured in amended Claim 1 that the vacuum purging step is selectively performed between any two steps of the ALD cycle of steps (S2-1), (S2-2), (S2-3), and (S2-4).

In the prior art including Paranjpe et al., the process chamber is purged with a high flow of an inert gas, and the chamber (201) may be pumped down to 10^{-6} Torr prior to deposition using a turbo molecular pump (220). Paranjpe et al. only disclose that the chamber (201) is pumped down prior to deposition using the turbo molecular pump (220), but do not disclose intervening vacuum steps using turbo molecular pump (220) during deposition. The purging method using inert gas in the prior art is different from the vacuum purging method of the present application, which prevents all the gases from inflowing into the reaction chamber and vacuumizes the inside of the reaction chamber, as recited in amended Claim 1. Therefore, the vacuum purging of the amended Claim 1 is not disclosed in the prior art including Paranjpe et al. Also, it is not disclosed in the prior art that the vacuum purging step is selectively performed between any two steps of the ALD cycle of steps (S2-1), (S2-2), (S2-3), and (S2-4).

Therefore, the present invention as recited in amended Claim 1 can improve the purging effect by using the inert gas purging method and vacuum purging method, compared with purging the reaction chamber only with an inert gas. By the improvement of the purging effect, the risk that one gas that remains in the reaction chamber and other gas that newly flows into the

chamber react in a gas-phase is eliminated. The effects obtained by the vacuum purging have been explained at page 8, line 31 to page 10, line 9 in the specification as originally filed.

In particular, Paranjpe et al. do not teach or suggest vacuum purging, which is selectively performed between any two steps of the ALD cycle of steps (S2-1), (S2-2), (S2-3), and (S2-4), wherein the vacuum purging is performed while preventing all the gases from inflowing into the reaction chamber, as in amended Claim 1. Therefore, Claim 1, including claims depending therefrom, i.e., claims 2-6, define over Paranjpe et al.

Accordingly, it is respectfully requested that the rejection to claims 1-6 under § 103(a) be withdrawn and allow the same to issue.

Conclusion

In view of the foregoing remarks distinguishing the prior art of record, Applicants submit that this application is in condition for allowance. Early notification to this effect is requested.

The Examiner is invited to contact Applicants' Attorneys at the below-listed telephone number regarding this Amendment or otherwise regarding the present application in order to address any questions or remaining issues concerning the same.

If there are any charges due in connection with this response, please charge them to Deposit Account 06-1130.

Respectfully submitted,

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